

# **CALFED Bay-Delta Program Project Information Form** **Watershed Program - Full Proposal Cover Sheet**

1. Full Proposal Title: **Study of Augmenting Groundwater Supplies**  
**Through Capture of Urban Runoff**  
 Concept Proposal Title/Number: **Water Augmentation Study (0136)**  
 Applicant: Los Angeles & San Gabriel Rivers Watershed Council (LASGRWC)  
 Applicant Name: Richard A. Harter, Executive Director  
 Applicant Mailing Address: 111 N. Hope Street, Suite 627 Los Angeles, CA 90012  
 Applicant Telephone: (213) 367-4111 Applicant Fax: (213) 367-4138  
 Applicant Email: Rick@LASGRiversWatershed.org  
 Fiscal Agent Name (if different from above): (same as above)  
 Fiscal Agent Mailing Address: \_\_\_\_\_  
 Fiscal Agent Telephone: \_\_\_\_\_ Fiscal Agent Fax: \_\_\_\_\_ Fiscal Agent Email: \_\_\_\_\_

2. Type of Project: Indicate the primary topic for which you are applying (check only one)

<input type="checkbox"/> Assessment	<input type="checkbox"/> Monitoring
<input type="checkbox"/> Capacity Building	<input type="checkbox"/> Outreach
<input type="checkbox"/> Education	<input type="checkbox"/> Planning
<input type="checkbox"/> Implementation	<input checked="" type="checkbox"/> Research

3. Type of Applicant:

<input type="checkbox"/> Academic Institution/University	<input checked="" type="checkbox"/> Non-Profit
<input type="checkbox"/> Federal Agency	<input type="checkbox"/> Private party
<input type="checkbox"/> Joint Venture	<input type="checkbox"/> State Agency
<input type="checkbox"/> Local Government	<input type="checkbox"/> Tribe or Tribal Government

4. Location (including County):

What major watershed is the project primarily located in:

☐ Klamath River (Coast and Cascade Ranges)  
☐ Sacramento River (Coast, Cascade and Sierra Ranges)  
☐ San Joaquin River (Coast and Sierra Ranges)  
☐ Bay-Delta (Coast and Sierra Ranges)  
☒ Southern CA (Coast and Sierra Ranges)  
☐ Tulare Basin (Coast, Sierra and Tehachapi Ranges)

5. Amount of funding requested: \$ 971,800 over 2 years

Cost share/in-kind partners? ☒ Yes ☐ No

Identify partners and amount contributed by each:

Cash:	US Bureau of Reclamation	\$ 50,000
	Metropolitan Water District (MWD)	50,000
	LA Regional WQ Control Board	50,000
	Water Replenishment District (WRD)	50,000
	LA County Dept of Public Works	50,000
	Los Angeles Dept of Water & Power	50,000
	City of LA Stormwater Mgmt Division	<u>20,000</u>
	(sub-total)	320,000

CALFED Watershed Program Solicitation  
Full Proposal – Questions & Answers

In-Kind: CA Dept of Water Resources	\$ 60,000
City of Santa Monica Urban Runoff Mgmt	<u>4,500</u>
(sub-total)	64,500
Grand Total	\$384,500

6. Have you received funding from CALFED before? ☐ Yes ☒ No  
If yes, identify project title and source of funds:

By signing below, the applicant declares the following:

1. The truthfulness of all representations in their proposal
2. The individual signing this form is entitled to submit the application on behalf of the applicant (if the applicant is an entity or an organization)
3. The person submitting the application has read and understood the conflict of interest and confidentiality discussion in the Watershed Program Proposal Solicitation Package and waives any and all rights to privacy and confidentiality of the proposal on behalf of the applicant, to the extent provided in the Proposal Solicitation Package.

**Richard A. Harter, Executive Director LA & SG Rivers Watershed Council**  
Printed name of applicant

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Signature of applicant

## **CALFED Bay-Delta Watershed Program Full Proposal - Questions & Answers**

### **Water Augmentation Study (0136)**

Los Angeles & San Gabriel Rivers Watershed Council

Rick Harter, Executive Director (213-367-4111)

#### **1. Describe your project, its underlying assumptions, expected outcomes, timetable for completion, and general methodology or process.**

The proposed Study of Augmenting Groundwater Supplies Through Capture of Urban Runoff (Water Augmentation Study) began as a pilot project with the collaborative oversight of nine (9) federal, state, regional and local agencies that have committed funding or agreed to provide in-kind services. Within the past two months, the US Army Corps of Engineers has also joined the steering group as its tenth core participant. The Los Angeles & San Gabriel Rivers Watershed Council (the “Watershed Council”) is playing a facilitative role in assembling the technical resources to design the work plan and to spearhead the effort to find sufficient funding to expand the pilot work into the full-scale program that all participants feel is ultimately necessary. The proposal is one element in the strategy to answer questions that have been identified by the Technical Committee for the long-term program. Those questions, which are still in progress of being developed, are included in this document as an Appendix to Item #8, beginning on page 10. The proposed ‘project’ that is the subject of this proposal therefore has antecedents and will also need to have several aspects of separate but related follow-on efforts. The work proposed to be funded under CALFED will bring the Watershed Program to the table as an active contributor and invest it in all future results of the larger study.

#### ***The Pilot Study***

As explained in the concept proposal, the Water Augmentation Study began in earnest partially in response to the institution by the Regional Water Quality Control Board of its Standard Urban Stormwater Mitigation Plan (SUSMP), which requires on-site retention of the first ¾-inch of each rainfall event as a device to reduce contaminant loadings from the “first flush” of stormwater flow. Stewards of groundwater resources, such as Watermasters and local water agencies, responded to this with great concern that the policy might simply transfer impacts of pollution from surface waters to the groundwater, thereby compounding environmental degradation. Proponents of the policy assume that intervening soil layers will filter out contaminants. But really, no one knows for certain about the ramifications of the policy in the context of California conditions. That is why the primary question being addressed in the initial work program is the water quality issue.

The Water Augmentation Study also has a wider background that grows out of the Water Shed Council’s vision for the watershed within the next generation (20-30 years). The Vision Statement (embodied in the document *Vision: 2025*) includes eight principal elements, several of which pertain to management of our local natural water supply, one of them being “Using all of our water resources efficiently.” The elaboration of this principle

refers to increased use of reclaimed water, groundwater recharge, and detention of stormwater, with the end result that, “The Los Angeles region, while still dependent on imported water, now provides a far greater proportion of its own water needs than the previous generation could have imagined.” As one step in promoting this objective, the Watershed Council sponsored the first monograph in its monograph publication series, entitled *Stormwater: Asset, Not Liability*. This book, which is currently already out of print due to such high interest and demand, set the stage for the Water Augmentation Study by inspiring the US Bureau of Reclamation to support us further in investigating stormwater infiltration as a means of increasing local water supplies.

The Bureau of Reclamation (BuRec) began by funding organization of the Pilot Study through the Watershed Council and also sponsoring a graduate student intern last summer to begin a literature review of stormwater infiltration mechanisms and monitoring/research results from around the country and indeed around the world. The student’s work led to a group within this year’s Master’s Seminar at UCSB’s Bren School of Environmental Science & Management adopting the topic of ‘Infiltrating Urban Runoff in the San Fernando Valley: A Case Study of Groundwater Recharge Potential,’ which was completed and reported just this week. Results of the student study will be presented at the Watershed Council’s regular Stakeholder Meeting in June. The literature review indicated that pollutants are widely present in urban runoff, but that many are volatilized or captured within the first 50-feet of the vadose zone. Some pollutants, however, have greater penetration potential and may require pre-infiltration treatment. The student work also applied an economic model that resulted in a very low cost effectiveness ratio against current wholesale water rates. However, costs were very grossly estimated and were not compared against the marginal cost of new water supply development. In sum, the initial results are intriguing and suggestive of further direction for subsequent inquiry.

The heart of the Pilot Study is physical collection of water samples and testing for constituents. The group has engaged a consultant – Montgomery Watson/Harza – which developed a Monitoring Plan (*Monitoring Plan to Evaluate the Impacts of Urban Runoff on Groundwater Quality*, January 2001) and has been working with DWR to install monitoring equipment at two selected sites. Montgomery Watson will be responsible for sample collection and analysis of laboratory results. Identification of the laboratory to conduct the constituent testing is the subject of a RFP, which is in progress. We have missed the opportunity to begin sample collection during the 2000/2001 storm season, but we will be prepared for the first storm of the 2001/2002 season. The sampling plan calls for collection at three storm events as well as background baseline sampling. Samples will be collected from monitoring wells and lysimeters installed upgradient and downgradient of BMPs. Details are specified in the *Monitoring Plan*, which is available for review but cannot be accommodated within the page limits of this proposal. BMPs are already in place at the two locations, which include a school site in the northeast San Fernando Valley and a commercial-office site in Santa Monica. Monitoring equipment will be installed through the in-kind contribution of DWR within the next two months. Final arrangements are currently in progress with the landowners and required permits will be obtained before installation.

### ***The Proposed Project Under CALFED Support***

The project as specified in the concept proposal and elaborated here is an extension of the pilot study through time. Funding of the Pilot Study is only sufficient for one season of sampling. The need for multi-season sampling is apparent to all; among other purposes in order to evaluate cumulative effects. The request to CALFED is for extension of the sampling period for an additional two storm seasons (2002/2003 and 2003/2004).

In addition to the CALFED proposal, the Watershed Council also has a proposal pending before the SWRCB for funding under Proposition 13. That proposal would extend the Pilot Study geographically, by adding six additional sites to the program, stratified by land use. The need to evaluate the effects of land use type on constituents in stormwater flow is also apparent to all; and is indeed one of, if not the major variable to be considered with regard to developing an implementation plan. Do some areas require pre-treatment? Are some areas to be avoided? We won't know this until the research is done. The Prop 13 proposal would also provide funding to develop the BMPs along with site selection, so that monitoring equipment could be co-located during installation rather than retrofitted in relation to existing BMPs as we are doing in the Pilot Study. The Prop 13 application passed the statewide ranking and has been recommended by staff for funding. The final decision by the SWRCB is scheduled for next week (May 2-3) and the staff recommendation is expected to be ratified. The Prop 13 proposal includes only enough funding for installation of the BMPs and monitoring equipment. It does not include sample collection, laboratory analysis and reporting of monitoring results. The CALFED proposal is critical in this regard because it ties in with the Prop 13 proposal to provide two seasons of sampling and analysis at these six additional sites, as well as the two initial Pilot Study sites.

### ***The Larger Study***

Ultimately, the project team is looking to support an effort over five years or longer that would: a) assess water quality implications of infiltrating urban runoff; b) develop an understanding of land use and soil factors in capturing runoff; c) assess the effectiveness of various infiltration BMPs in reducing or eliminating pollutants; d) quantify the amount of stormwater that could realistically be secured; e) develop an understanding of economic, social and institutional factors in creating a program to implement widespread infiltration; and f) assuming the notion has demonstrated feasibility from water quality, engineering and economic perspectives, develop an implementation plan to deploy infiltration devices in appropriate locations and settings, along with guidelines for sustainability. For the overall program, the project team is pursuing federal, state and local funding in approximately a 50/25/25 split. Funding from CALFED, along with funding under Prop 13, will constitute a portion of the state contribution, and be leveraged as a 'local match' for federal dollars. Therefore, investment in the program at this point will have heightened value and greater benefits than it might otherwise have as a stand-alone initiative.

- 2. Describe your qualifications and readiness to implement the proposed project.**
- a. Describe the level of institutional structure, ability and experience to administer funds and conduct the project. Identify the fiscal agent responsible for handling the funds.**

The request for CALFED support involves continuation and expansion of the activities that have already begun under the Pilot Study. The ten organizational sponsors have placed their confidence in the Watershed Council to lead this effort, and the Watershed Council acts in full collaboration with them all through regular (usually monthly as situations warrant) Technical Committee meetings and occasional Plenary Session meetings, where a wider group of stakeholders have been participating.

The Executive Director of the Watershed Council – Rick Harter - would be personally designated as Fiscal Agent for the study since he is already fulfilling that role for the Pilot Study. He recently came to the Watershed Council after 14 years of private consulting experience in the fields of urban and environmental planning. He is highly experienced in managing budgets on this order of magnitude, as well as managing contractors, work programs and schedules. He is currently responsible for managing the Prop 204 grant funds, which are channeled from the Coastal Conservancy to project sponsors through the Watershed Council. In that role, he is dealing with California State contracting procedures and overseeing the conduct of work by the grantees.

- b. Describe technical support available (including support needed for environmental compliance and permitting) to begin and complete the project in a timely manner.**

CEQA/NEPA compliance will be unnecessary for the proposed use of funds, since they are earmarked for data collection, laboratory analysis and report writing. The CALFED funds would not be used for BMP installation. In any case, the Executive Director comes from 14 years of primarily preparing CEQA/NEPA documentation and is highly familiar with all aspects of environmental compliance. Should any circumstance arise where environmental review and/or permitting were required, mobilizing the necessary resources would be a very simple matter.

The work plan has evolved with the collaboration of Montgomery Watson/Harza, which as a newly merged entity is a worldwide leader in water resource engineering. There are literally no technical issues pertaining to the proposed type of study that are beyond the capabilities of this firm, and the participating agencies that are involved. Technical support is not a problem.

- c. List any previous projects of this type you or your partners have implemented, funded either by CALFED or other programs.**

The proposal is an extension of the existing Pilot Study work, which is based on existing standard engineering and scientific practices. Montgomery Watson and the participating agencies are highly familiar with this type of endeavor and have substantial experience in dealing with it.

- 3. Provide a completed budget cost sheet and describe the basis for determining project costs, including comparisons with other similar projects, salary comparisons, and other listed costs. Include all costs of environmental compliance, such as CEQA and/or NEPA, and permits. Describe how the approach to achieving the stated goals of the project demonstrates an effective cost relative to its anticipated benefits.**

The attached budget reflects an extrapolation of costs developed in the *Monitoring Plan* for the two initial sites of the Pilot Study. It accounts for ‘operational’ costs only, as installation is already assumed to have occurred. Those costs were developed by Montgomery Watson (MW), which has been selected as the technical consultant for the Pilot Study. Montgomery Watson is not called out separately as a “sub-contractor” in Budget Summary I because they are doing virtually all the work. The only addition to their costs is a 7.5% administrative ‘fee’ for the Watershed Council. This allocation actually covers less than the full cost of the Executive Director’s and other staff time involved in the project. Task 1 includes both this administrative fee and work effort allocated as “management” in the MW contract. It should be pointed out that while MW is under contract for the Pilot Study, there is no assurance that MW will also be selected for the work proposed here. We will develop a separate solicitation for the second and third year sampling, although MW will be eligible to participate in the process and might in fact be selected for this work as well.

The ‘matching funds’ of \$220,000 in the budget sheets differs from the \$384,000 shown on the cover sheet for several reasons. One is that some of the cash contribution (\$100,000 from BuRec and MWD) has already been expended on developing the *Monitoring Plan* and conducting the literature review. Second is that the in-kind contributions are allocated to installation of monitoring equipment at the two initial sites. These will already be in place before the proposed CALFED-funded portion of the project begins. The ‘matching funds’ shown in the budget sheets are actually applied to the first season of monitoring at the two sites, based on the proportional breakdown of tasks detailed in this proposal. Results from the first season of monitoring will be combined with the second and third year for an overall report on the program.

The budget sheets do not show ‘hours’ or ‘labor rates’ because the budget was not developed using that methodology. Labor rate would have to be a derivative that reflects a blended rate, and as such would make little sense. Moreover, it would make no sense at all with regard to Lab Analysis, where costs are based on unit factors for different constituents.

The costs associated with this project are very reasonable, based as they are on features such as the fact that the laboratory of reference is the County’s Department of Public Works lab, which has lower-than-full market rates and is accessible to this project because of the Department’s involvement in the work.

**4. Describe the technical feasibility of the proposed project.**

- a. Describe any similarity to previously implemented successful projects in this community or elsewhere.**

We have conducted an extensive review of scientific literature on constituents of urban surface water runoff and on infiltration engineering studies. To date, we have reviewed over 80 articles and annotated over 40 of them. This literature will be summarized in the report to be produced on the pilot study.

- b. If the project proposes a new approach or new method with a high likelihood of adding new knowledge and or techniques, or with the potential to fill identified gaps in existing knowledge, describe how it will do so, and what monitoring components will provide substantiation of results.**

The sampling plan and analytical methodology follow standard guidelines and protocols, so the proposal does not involve a new approach or method in that regard. Infiltration of urban runoff is not a new concept, although it is less widely applied in the United States than in certain other countries. The gaps in existing knowledge are in large part based on environmental concerns and the tendency for people to create and regulations without first understanding their ramifications. Before endorsing widespread implementation of a strategy, it should be grounded in what we know. The steering committee is looking closely at this, and we have included a portion of our working document as an Appendix following Item #8 below.

- c. Explain how the finished project will be maintained as necessary, and to what degree it may require continued funding from outside the community.**

The ‘finished product’ will be a research report that will be widely disseminated for discussion and consideration. Expenses related to publication and dissemination have not been factored into this budget, but will be accounted for in the ‘larger study’ budget. It is also likely that the Watershed Council will take responsibility for this under its on-going publication program.

**5. Describe how the monitoring component of the project will help determine the effectiveness of project implementation and assist the project proponent and CALFED with adaptive management processes.**

- a. Identify performance measures appropriate for the stated goals and objectives of the project.**
- b. Describe how this project will coordinate with and support other local and regional monitoring efforts.**
- c. Provide a description of any citizen monitoring programs that will be part of this project.**
- d. What monitoring protocols will be used, and are they widely accepted as standard protocols?**
- e. Describe how the type and manner of data collection and analysis will be useful for informing local decision making?**



The proposed project is essentially a research program that has been highly thought out and is described in detail in the *Monitoring Plan*. This 35-page document can be made available upon request, but is not included with this submittal due to page limitations. There is no citizen monitoring involved; all samples will be collected by trained technicians and conveyed under standard chain-of-custody practices to a certified laboratory for testing and analysis.

The overall work plan includes consideration of ambient groundwater quality conditions that are monitored on an on-going basis by several agencies that are participating on the Technical Committee. The results of the analyses will be made available through the Watershed Council's Stakeholder Meetings and its publication program. The study was inspired by concerns of local decision-makers and reporting of the results will be targeted to this audience of municipal agencies and officials.

- 6. If this project is to develop specific watershed conservation, maintenance or restoration actions, describe the scientific basis for the action(s) described in the proposal. Include the following:**
- a. Any assessment of watershed condition(s) that has already been developed by you or others.**
  - b. Previous assessment(s) used to establish your project goals and objectives, or to inform the basic assumptions of your proposal.**
  - c. A description of the scientific assumptions used to develop the project goals, objectives and proposed actions, and the degree to which those assumptions are widely accepted (both in the science community as a whole, and in the watershed community).**
  - d. A discussion of how the proposed actions are (are not) consistent with the scientific assumptions and previous assessments completed in the watershed.**
  - e. A description of what baseline knowledge was used to support the management actions described in the proposal, or the likelihood that the management actions will generate more robust baseline knowledge.**

Again, the proposal is to support a research program; specific conservation, maintenance or restoration activities are not directly involved. The research is grounded in the scientific literature regarding the fate-and-transport of contaminants through the vadose zone and is intended to generate more robust knowledge regarding the dynamics of infiltrating urban runoff.

- 7. Please answer the following questions:**
- a. How will the proposal address multiple CALFED objectives (see Section I) in an integrated fashion, with emphasis on water supply reliability, water quality, ecosystem quality, and levee stability objectives CALFED has established for Stage 1 of the program?**

While the answer to this question was well elaborated in the concept proposal, it is obvious that the proposed project relates directly and most strongly to CALFED's primary objective with regard to Water Supply of reducing the impacts of water diversions on the Bay-Delta system through demand-side management. If areas in the Solution Scope that import water through the SWP can increase available local supplies, the pressure on supplies in northern

and central California can be moderated if not reduced. While not directly supported through this CALFED proposal, one aspect of the ‘larger study’ is to estimate the potential amount of water to be made locally available through infiltration. When that work occurs, we will be able to quantify the benefits in acre-feet of relatively-reduced diversion. Such quantification is to be based on detailed factors such as sub-watershed efficiency, rather than on grossly simplified estimation, and would account for ‘ambient’ growth in demand. It is unlikely that actual demand would decrease, but rather that increase in demand would be reduced.

The proposed project also relates indirectly to CALFED’s primary objective with regard to Water Quality of reducing or eliminating parameters that degrade water quality at its source. Urban stormwater is a factor in many areas of the Bay-Delta system. Lessons learned from the proposed project will be very useful to local initiatives there that have the same purpose of reducing surface water contamination. Results from the study are easily transferable to other areas of the State and it is intended through the publication program of the Watershed Council to disseminate our findings to other areas in the nation as well as other countries. With regard to measuring the benefits of Water Augmentation Study results to the Bay-Delta system, again as part of the ‘larger study’ we intend to quantify mass-loading levels of ‘pollution avoided’ with regard to diversion of potentially-contaminated surface water to the vadose zone and ultimately the groundwater. On a per-unit basis, this information could be transferable to other locations within the Bay-Delta system.

**b. Explain how the proposal will help define and illustrate relationships between watershed processes (including human elements), watershed management, and the primary goals and objectives of the CALFED (see Section I).**

Currently, rainfall in Los Angeles does not function as resource beyond immediate and local sustenance of vegetation. This was highly apparent this past storm season, which witnessed higher-than-average rainfall in the Los Angeles area at the same time as lower-than-average rainfall in the rest of California and the Northwest and lower-than-normal snowpack in the Sierras has water planners concerned both for reserve levels and for electricity production shortfalls. Often when I would mention to someone, “Well, we need the rain!” they would respond, “Why? All it does is flow to the sea.” You must realize that our office is in the LADWP building, so people in its elevators are more knowledgeable than the average person on the street in downtown LA. Nevertheless, it is true that we do not currently utilize stormwater as a resource, and that is precisely what the Watershed Council is attempting to change. If the research program confirms that urban runoff is safe to infiltrate with regard to avoidance of contamination, we will gain confidence in using infiltration as a strategy of reducing pollution in our surface water bodies and of capturing stormwater for human uses before it reaches the sea.

**c. Identify a lead agency for environmental compliance, such as CEQA or NEPA. Describe the program’s strategy and timetable on environmental compliance.**

The proposed use of CALFED grant funding for sample collection, laboratory analysis and report writing, does not require subsequent CEQA/NEPA review. Therefore, no lead agency has been identified. See the proposal’s required forms – especially the Land Use Checklist, Environmental Information Form, and Environmental Permits/Approvals Form – for

satisfaction of environmental compliance under the Final Programmatic EIS/EIR for CALFED's Watershed Program Plan.

**8. Describe any other important aspects of your program that you could not address in the above items, and that you feel are critical to fully describing your project.**

The comments received from CALFED staff on our original concept proposal suggested that this project coordinate with the Sun Valley Watershed Management and Water Replenishment Project proposal from the LA County Department of Public Works. We are, of course, in close contact with their Watershed Management Division, which is a contributing partner on the Water Augmentation Study. Also, Montgomery Watson is working with DPW on the Sun Valley Project and we have significant cross-fertilization of ideas. TreePeople, which is working with DPW on the Sun Valley Project, and which also has an educational outreach proposal, is represented on the Watershed Council Board of Directors. In sum, we are well networked with this effort and have already taken into account how we might coordinate and collaborate.

The focus of the Water Augmentation Study proposal to CALFED is on stormwater sampling and analysis; BMP installation is the subject of the correlated Prop 13 proposal. We would most likely collaborate with Sun Valley in regard to identifying sites for BMP installation. Or, if we were not to install BMPs as part of our program and instead continue to capitalize on BMPs installed by others, we would collaborate with the Sun Valley project in using their BMPs as monitoring sites for our purposes.

In fact, at this point in time, the Water Augmentation Study is quite a bit further along in its implementation needs than the Sun Valley Project is ready to provide. The DPW proposal is focused on developing a Plan that would develop an overall management strategy and, among other aspects, identify BMP sites and the particular appropriateness of BMP types. It does not, at this stage, involve actual installation or monitoring until the Plan has been developed in consultation with the community. Once the Plan is established, we would be very pleased to coordinate our monitoring program with the one developed for their needs. The two are complementary in that the focus of the Sun Valley Project would be on monitoring of BMP 'effectiveness' with regard to quantities of water infiltrated and maintenance of the system (does quantity degrade over time through clogging or other mechanisms?) while the focus of the Water Augmentation Study is currently on the ability of BMPs and the underlying vadose zone to filter contaminants before reaching the groundwater.

## **APPENDIX: WHAT WE NEED TO KNOW TO SAFELY INFILTRATE STORMWATER WHERE IT FALLS<sup>1</sup>**

Before any new program of any scale can be undertaken, all potential unintended consequences must be carefully examined. These questions fall into several categories, which also delineate the various phases of the research needed.

### **1. Impacts on Groundwater Quality.**

Should infiltrating stormwater runoff and air deposition negatively affect the quality of our groundwater, contaminate it in any way, this study will cease. Initial investigations lead us to believe that it will not. But sufficient doubt exists that we must prove it beyond doubt. Therefore, Phase I is/will investigate the fate and transport of urban pollutants as they fall from the sky, as they enter various infiltration BMPs, enter the ground, and (if they travel) enter the groundwater. Phase I should/will examine these impacts on various BMPs, land uses, and through a variety of soil types.

### **2. Determining Where, and Where Not to Install Infiltration BMPs.**

- **Soil Maps.** In the Los Angeles area, the last soils map by the Soil Conservation Service was done in 1914. Others have mapped parts of the area of interest. Many wells have been drilled, and records kept of core samples. All this data must be compiled into a GIS data base before we can determine infiltration rates, fate and transport of contaminants, etc.
- **Groundwater Maps.** There are areas of high groundwater in our region that would not be suitable to infiltrate stormwater due to concerns about local flooding and liquefaction in an earthquake. Other areas have clay lenses underground that might prevent stormwater from reaching usable groundwater.
- **Land Uses.** Differing land uses have different consequences for the contaminants found in runoff. They also present differing opportunities and problems.
- **Existing Physical Features.** Steep slopes, inefficient existing catchments, and other physical features may present additional problems.
- **Map brownfields** and other known contaminated sites. Determine the cutoff point where soils are too contaminated to infiltrate water through them and maintain groundwater quality.
- **Determine Retrofit Requirement** of various BMPs to determine each one's effectiveness in a variety of soil and land use conditions. Can we establish universal concepts to apply all over the basin?

### **3. Quantify the Additional Drinking Water we could Harvest.**

- Assess the infiltration rates of various BMPs in various soil types
- Perform a hydrologic study to understand runoff characteristics, quantities, intensities, ability to capture.

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<sup>1</sup> from a Working Paper to scope the Larger Five-Year Study Plan

- Assess the economic costs and benefits of harvesting drinking water through infiltration.

**4. Assess the Economic Value of Water Harvested** by comparing it against the marginal costs of a new water supply taking into consideration the avoided costs of energy needed to bring imported water to our region, air quality costs, and other hidden costs.

**5. Develop Design Standards for BMPs.**

**6. Explore the Socio-Political Impacts** of various methodologies needed to encourage installation of BMPs. Assess a variety of such methodologies and incentives. There will be great resistance by the small cities in the county to anything they think will cost them money.

**7. Identify and Assess Any Institutional Barriers** to requiring or encouraging widespread installation of infiltration BMPs.

**8. Assess the Unifying aspects** of this amazing partnership that includes 11 Federal, State, Regional, and Local Agencies:

The Bureau of Reclamation,  
The Army Corps of Engineers,  
State Department of Water Resources  
Metropolitan Water District of Southern California  
Water Replenishment District  
Los Angeles Regional Water Quality Control Board  
Los Angeles County Department of Public Works  
City of Los Angeles Department of Water and Power  
City of Los Angeles Stormwater Division  
City of Santa Monica Stormwater Management  
The Los Angeles and San Gabriel Rivers Watershed Council

## Water Augmentation Study (0136)

## CALFED Watershed Program Budget Sumary I

Task Description	Labor Rate*	Hours	Total Labor	Supplies	Travel	Materials	Sub- contract**	Match	CALFED	Total
Task 1: Administration			\$176,400	\$400		\$17,000		\$22,000	\$171,800	\$193,800
Task 2: Maintain Equip			\$52,800		\$400	\$4,800		\$10,000	\$48,000	\$58,000
Task 3: Sample Collection			\$243,800	\$200	\$1,200	\$22,800		\$60,000	\$208,000	\$268,000
Task 4: Lab Analysis			\$469,600	\$400		\$46,000		\$100,000	\$416,000	\$516,000
Task 5: Reporting			\$142,000	\$600	\$2,400	\$11,000		\$28,000	\$128,000	\$156,000
<b>Totals:</b>			\$1,084,600	\$1,600	\$4,000	\$101,600	\$0	\$220,000	\$971,800	\$1,191,800

\*Provide benefits/salary percentage here

18.0%

\*\*Provide a separate itemized budget using this format for subcontracts

## CALFED WATERSHED PROGRAM BUDGET AND PROJECT SUMMARY II

### Water Augmentation Study (0136)

Task Description		Completion date	Match funds	CALFED funds	Total
Task 1:	<u>Administration</u>	Month 24	\$22,000	\$171,800	\$193,800
	Task 1a: Tech Comm & Plenary Session Meetings		\$12,000	\$67,200	\$79,200
	Task 1b: Oversight & Communication		\$10,000	\$104,600	\$114,600
	Task Product(s): Minutes of Meetings				
	Success Criteria: Timely responsiveness, prompt payment of bills, accurate accounting				
Task 2:	<u>Maintain Monitoring Equipment</u>	Month 20	\$10,000	\$48,000	\$58,000
	Task 2a: Pre-Season Clean-out		\$8,000	\$38,400	\$46,400
	Task 2b: Test & Repair		\$2,000	\$9,600	\$11,600
	Task Product(s): N/A				
	Success Criteria: Functioning equipment that produces adequate samples.				
Task 3:	<u>Sample Collection</u>	Month 20	\$60,000	\$208,000	\$268,000
	Task 3a: Baseline		\$8,000	\$24,000	\$32,000
	Task 3b: Storm Events (8)		\$52,000	\$184,000	\$236,000
	Task Product(s): Samples appropriately handled and delivered to lab.				
	Success Criteria: Zero % rejected samples, adequate volumes for testing.				
Task 4:	<u>Lab Analysis</u>	Month 20	\$100,000	\$416,000	\$516,000
	Task 4a: Priority 1		\$56,500	\$235,000	\$291,500
	Task 4b: Priority 2		\$43,500	\$181,000	\$224,500
	Task Product(s): Lab sheets with test results.				
	Success Criteria: Properly identified reports that can be readily analyzed.				

Task 5:	<u>Reporting &amp; Presentations</u>	Month 24	\$28,000	\$128,000	\$156,000
	<i>Task 5a: Quarterly Progress Reports</i>		\$4,000	\$20,000	\$24,000
	<i>Task 5b: Draft Report</i>		\$15,000	\$67,000	\$82,000
	<i>Task 5c: Final Report</i>		\$8,000	\$36,000	\$44,000
	<i>Task 5d: Presentations</i>		\$1,000	\$5,000	\$6,000
	Watershed Council				
	CALFED				
	Task Product(s): <i>Interim Report at end of first season, Draft &amp; Final Report of program results.</i>				
	Success Criteria: <i>On-time and within-budget.</i>				
Total			\$220,000	\$971,800	\$1,191,800